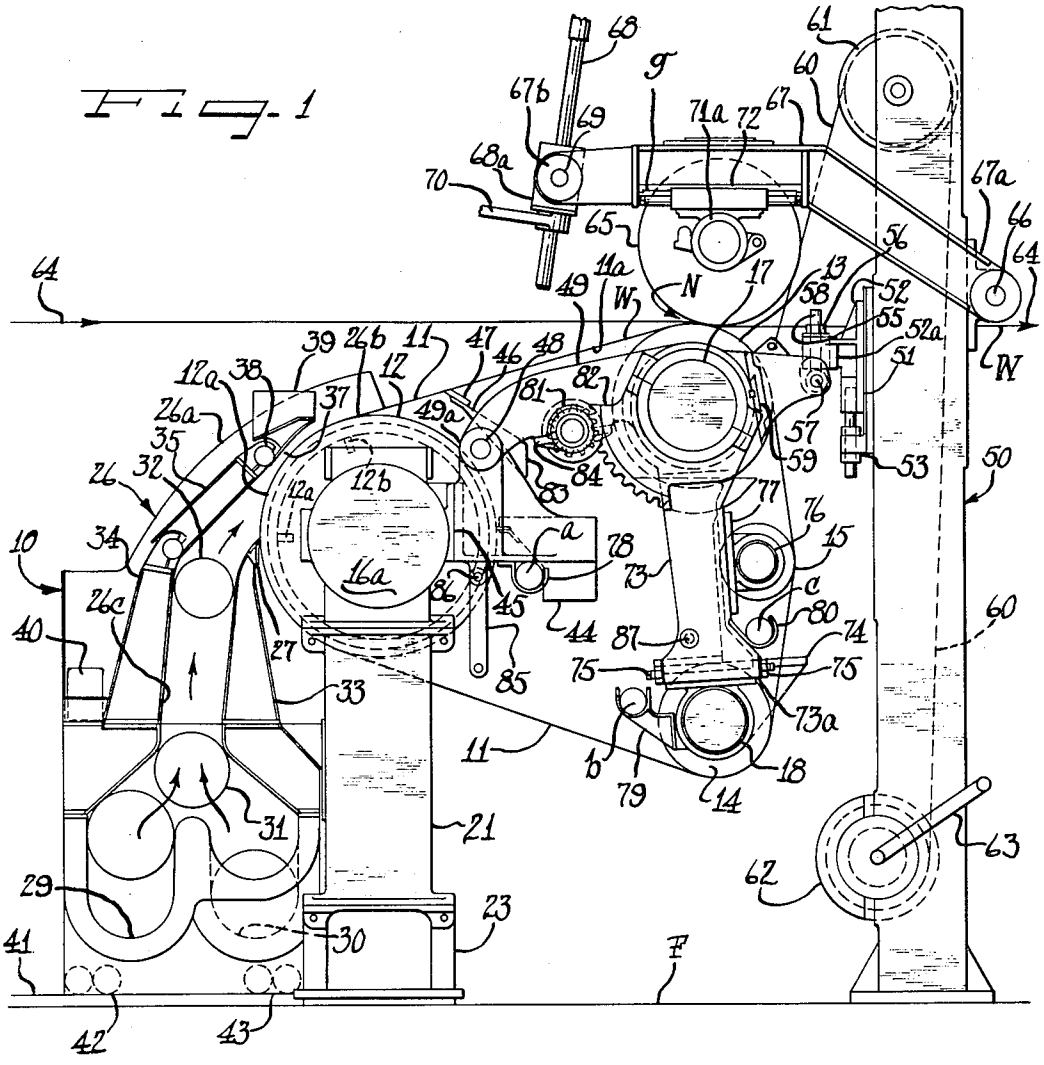
July 24, 1956 E. D. BEACHLER 2,755,710

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Fig. 1



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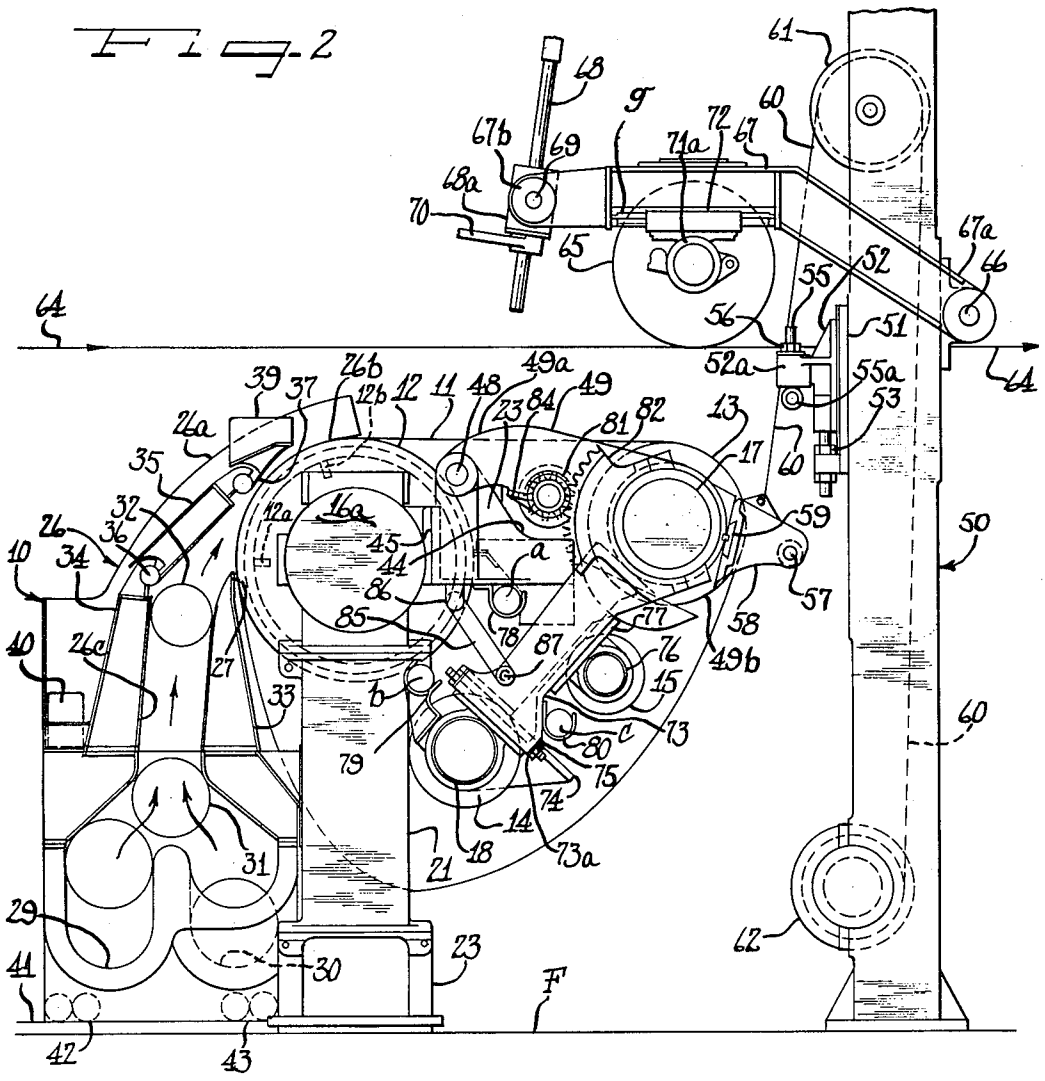
by Hill, Sherman, Meroni, Gross & Simpson Attys.

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Fig. 2



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Fig. 3

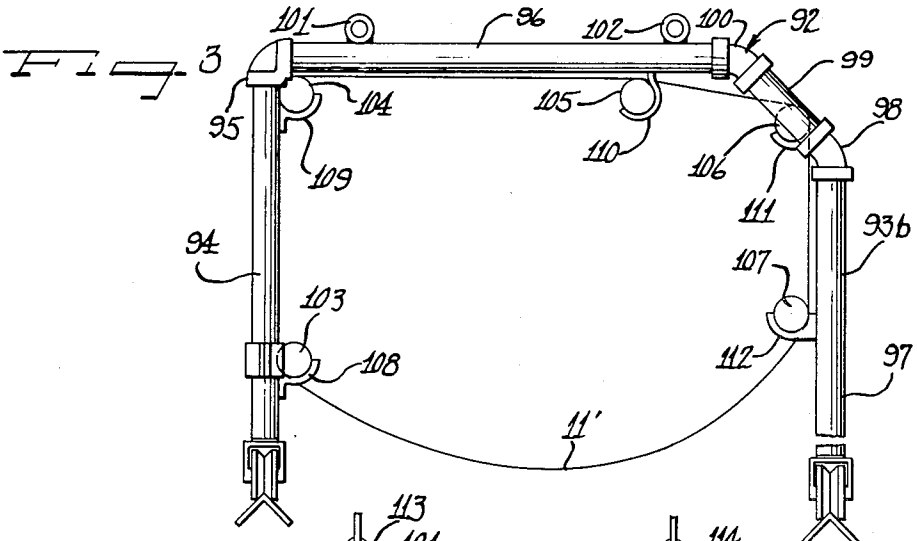
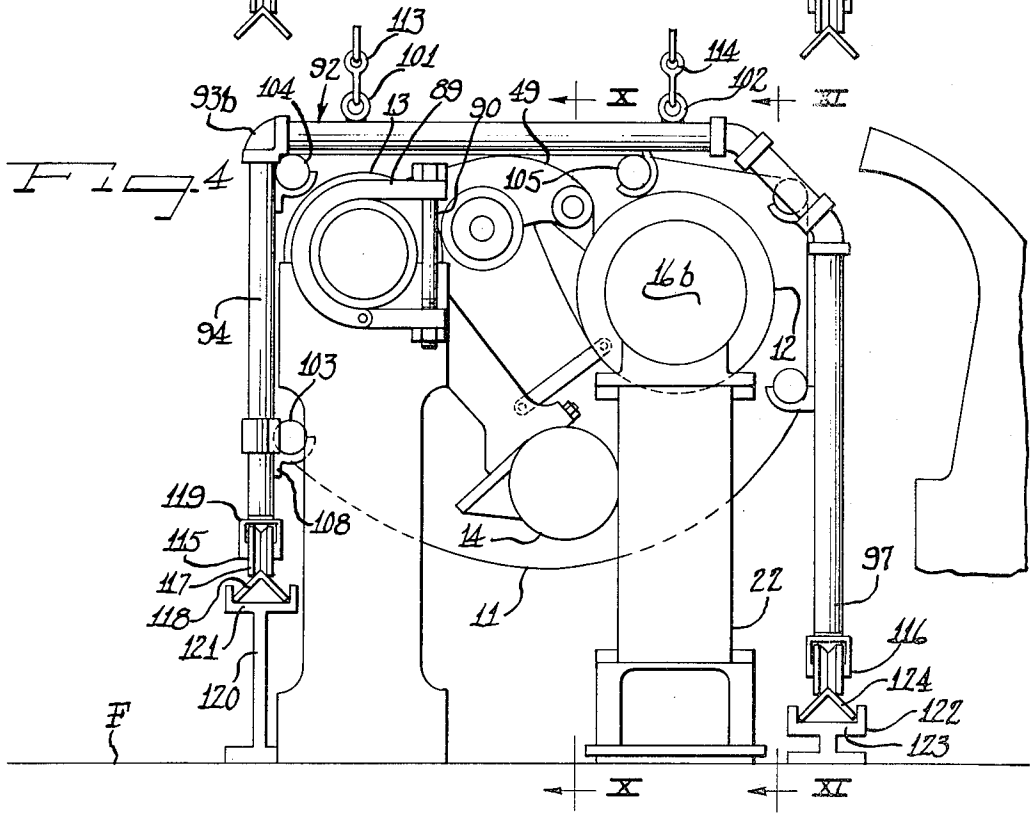


Fig. 4



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FIG. 5

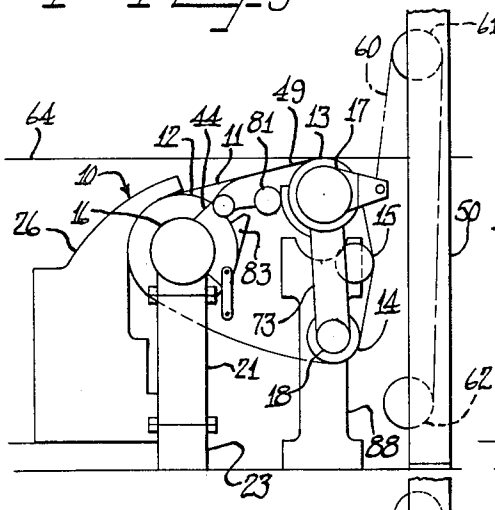


FIG. 6

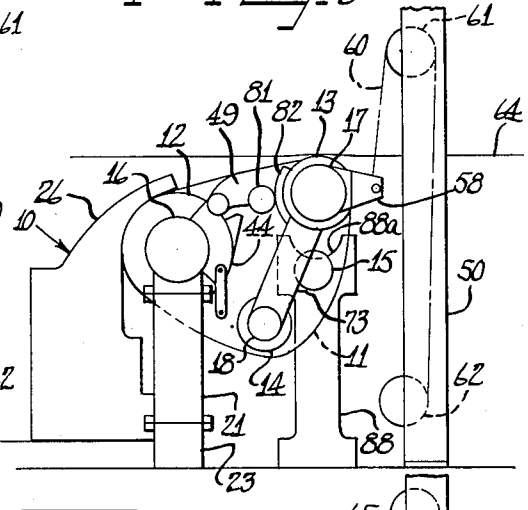


FIG. 7

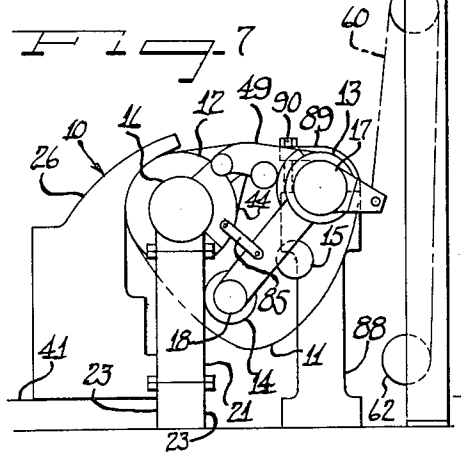


FIG. 8

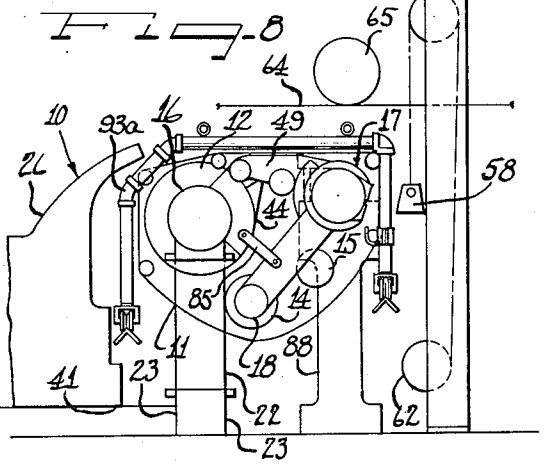


FIG. 9

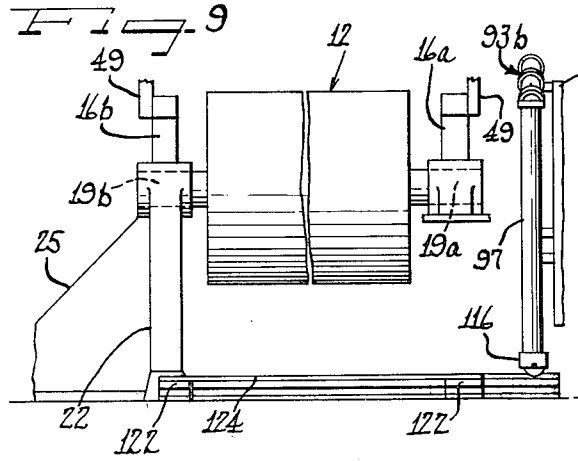
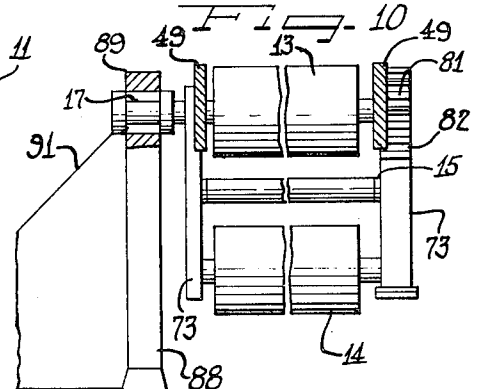


FIG. 10



Inventor

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by Hill, Sherman, Meroni, Gross & Simpson

United States Patent Office 2,755,710 Patented July 24, 1956

2,755,710

PAPER MACHINE

Edward D. Beachler, Beloit, Wis., assignor to Beloit Iron Works, Beloit, Wis., a corporation of Wisconsin

Application January 22, 1954, Serial No. 405,590

30 Claims. (Cl. 92—43)

This invention relates to a paper forming machine, and more particularly, to an improved cylinder-mold paper machine of the type wherein one, and preferably a plurality of cylinders rotating toward the same direction and positioned in line are arranged so as to deposit successively fibrous webs onto the bottom side of an overhead pickup felt to obtain a multilayer paper product.

Although cylinder-mold paper machines have been used for a number of years in the paper machine art, particularly in the formation of multi-layer paper webs, there have been a number of difficulties encountered in commercial operation of machines of this type. As mentioned, the general arrangement in machines of this type calls for a plurality of separate cylinders or cylinder molds positioned in line so as to successively deposit fibrous webs upon a pickup felt running over the top of each of such cylinders. Unfortunately, there is very little flexibility in an arrangement such as this, since the pickup felt must run in line so as to engage the top portion of each of the cylinders for the purpose of removing the fibrous web therefrom. If one of the cylinders must be taken out of service, the entire machine must be shut down. Also, if it is desired to employ stocks having different properties at the inlets for the various cylinders, substantially no variation can be permitted in the cooperation between the pickup felt and the cylinder itself so as to effect a more preferred manner of picking up the various different fibrous webs formed on different cylinders. A certain maximum operating speed is also ascertained by the fixed cooperation between the cylinder and the overrunning felt.

The instant invention provides for a novel arrangement of elements associated with each cylinder so as to permit greater flexibility in operation and the simplified procedure for shutting down and starting up an individual cylinder mold unit without shutting down the entire machine. Also, the instant invention provides for an improved arrangement for positioning the instant cylinder elements so that the short forming wire which cooperates therewith may be removed or replaced by the use of an improved wire stringing device. These advantages are accomplished by the use of a cylinder plus a couch roll within the loop of a short forming wire and by the use of certain structural arrangements for mounting the couch roll and cylinder and for movement of the same relative to each other during wire removal or replacement.

It is, therefore, an important object of the instant invention to provide an improved cylinder-mold paper machine, having greater versatility of operation and being capable of longer continuous operation than heretofore achieved.

Another object of the instant invention is to provide an improved cylinder-mold paper machine comprising a looped forming wire, a cylinder, a couch roll and a turning roll, all positioned within the loop of the wire and maintaining the wire in tensioned operating position, mounting means rotatably supporting the cylinder, first

bearing means rotatably carrying the couch roll, and second bearing means rotatably carrying the turning roll, at least one of said bearing means being mounted swingably about said cylinder mounting means to effectively swing the roll carried thereby in and out of its position for maintaining the wire in tensioned operating position.

A further object of the instant invention is to provide an improved wire changer or stringer adapted to cooperate with a cylinder and a couch roll swingable about the cylinder.

Other and further objects, features and advantages of the instant invention will become apparent to those skilled in the art from the following detailed disclosure thereof and the attached drawings forming a part hereof, which show preferred embodiments of the instant invention.

On the drawings:

Figure 1 is a side elevational view showing an individual unit of a cylinder-mold paper machine embodying the instant invention;

Figure 2 is a side elevational view of the embodiment of Figure 1, showing the rolls in a different positional arrangement, to be used during changing of the wire;

Figure 3 is a view in elevation taken from one side of a wire changer embodying the instant invention;

Figure 4 is a side elevational view showing some parts diagrammatically of the rear or opposite side from that shown in Figures 1 and 2 of the cylinder unit shown in Figures 1 and 2;

Figure 5 is essentially a diagrammatic view showing the unit (having the detailed structure shown in Figures 1, 2 and 3) in operating position;

Figure 6 is essentially a diagrammatic view of the unit shown in Figure 5 after the first step has been taken in the changing of the wire in this unit;

Figure 7 is another diagrammatic view of the unit shown in Figures 5 and 6 after the second step has been taken in preparing for the changing of the wire;

Figure 8 is still another view of the unit shown in Figures 5, 6 and 7 wherein these steps have been completed for arranging the rolls for the wire change and the wire changer is shown in position;

Figure 9 is an essentially diagrammatical view of the cylinder mounting, which may be considered to be taken substantially along the line IX—IX of Figure 4, and showing partially the wire changer; and

Figure 10 is essentially a diagrammatical view of the mounting of the couch roll and turning roll in shut-down position and this view may be considered to be taken substantially along the line X—X of Figure 4 with certain parts omitted and others shown in section, for the purpose of simplicity.

As shown on the drawings:

As is most easily seen from the diagrammatic view of Figure 5, an individual unit designated generally by the reference numeral **10** in the instant cylinder-mold paper machine comprises a looped forming wire **11**, a cylinder **12**, a couch roll **13** and a turning roll **14**, the cylinder **12**, couch roll **13** and turning roll **14** all being positioned within the loop of the wire **11** and maintaining the wire in tensioned operating position. The tensioning roll **15** actually serves to perfect the tension on the wire **11**. The unit **10** is also provided with mounting means or housings **16** rotatably supporting the cylinder **12**, first bearing means **17** rotatably carrying the couch roll **13** and second bearing means **18** rotatably carrying the turning roll **14**, with at least one of the bearing means **17** and **18** being mounted swingably about the cylinder mounting means **16**, so that one or both of the rolls **13** and **14** may be swung out of tensioning position with respect to the wire **11**. Preferably, the arrangement is made as

shown so that both of the rolls 13 and 14 may be swung toward the cylinder 12 and out of tensioning position, as will be described in some detail hereinafter.

Referring now to Figures 1 and 2 for a more detailed description of the instant invention, it will be seen that the cylinder 12 (which may be a cellular type or a perforated shell type suction roll with a gland between 12*a* and 12, for example), whose mounting from an end view is also shown in the essentially diagrammatical view of Figure 9 from an end view of the machine, has front and rear bearings 19*a* and 19*b*, respectively, which are suitably mounted in bearing housing support members 16*a* and 16*b*, respectively. The bearing support means 16*a* and 16*b* are in turn supported by front and rear columns 21 and 22, respectively, which in turn are mounted on front and rear base supports 23 and 24, respectively. It will be noted that the front column 21 is removable, being affixed to the front base member 23 and to the front bearing housing 19*a* by suitable flange and bolt assemblies; whereas the rear column 22 may be permanently or detachably connected to the rear base member 24 and the rear bearing housing 19*b*, although the rear column 22 has attached thereto a suitable anchoring or counterbalancing member 25 which cooperates with the column 22 to cantileverly support the cylinder 12, as shown in Figure 9. It will also be understood that suitable axially aligned draw-off means and the like (not shown) which are used for the ordinary operation of a cylinder are mounted at the permanent or fixed rear bearing housing 16*b* extending through a hollow shaft into the inside of the cylinder 12. The details of these draw-off lines and other operating devices are well known to those skilled in the art and need not be further discussed herein.

Referring now to the stock inlet designated generally by the reference numeral 26 and shown in Figures 1 and 2 with the front wall removed, it will be noted that the rear wall 26*a* extends upwardly and just over the top of the cylinder 12 with its leading edge 26*b* conforming with the arcuate periphery of the cylinder mold 12. As those skilled in the art will appreciate, the inlet 26 has a pair of sealing devices at opposite ends of the cylinder 12, one of which is positioned along the leading edge 26*b* of the rear wall 26*a* and the other is on the front wall (not shown). These sealing devices coupled with a laterally extending seal at 27 suitably direct the flow of stock onto the wire covering the uprunning side of the cylinder 12. The stock enters the inlet 26 through a pair of adjacent conduits 29 and 30, which may be suitably connected to a source of stock by flexible piping or the like (not shown). The stop is directed into the conduits 29 and 30 in the form of oppositely flowing streams of stock and from there the stock flows upwardly through the rectifier roll 31 into a narrowing conduit 26*c* of the inlet and then through another rectifier roll 32 and against the uprunning side 12*a* of the wire covered cylinder 12. The intermediate narrowing conduit portion 26*c* is defined by a front wall 33 which supports at its top the laterally extending sealing means 27 and a rear wall 34 which supports at its top a movable wall 35 by means of a pivotal mounting 36 which permits movement of the wall 35 away from and toward the cylinder 12 for the purpose of defining the inlet opening at 37. An additional pivotal mounting at 38 permits additional adjustment of the top wall portion 39. Excess stock may flow back over the top wall portion 39 and the movable wall 35 down to a drain at 40 for recirculation.

The inlet 26 is movable for wire changing purposes which will be explained in detail hereinafter, and the inlet 26 is movable on a pair of tracks 41 which support rollers 42 and 43, so that the inlet 26 may be moved to the left a short distance, as shown in Figure 8.

Referring again to the mounting for the cylinder 12, it will be noted that the cylinder 12 is not moved during the shut-down for wire removal or replacement. Instead, the inlet 26 is moved slightly away from the cylinder 12 to permit wire removal; and the front column 21 supporting the front bearing housing 16*a* is removed so that the wire 11 may pass freely underneath the bearing 19*a*.

The cylinder bearing housings or framework 16*a* and 16*b* at the front and back of the cylinder 12 each have a projecting frame member 44 which extends in the general direction of the rolls 13 and 14 and which is firmly affixed to the bearing housing member which carries the frame 44. As shown in Figures 1 and 2 in some detail, only the front frame 44 will be described, the rear frame being substantially identical thereto although symmetrical with respect thereto. The frame 44 may be affixed to the bearing housing 16*a* by welding, for example, at 45 and the frame extends to the right of the bearing housing 16*a* and slightly upwardly therefrom. Near the top of the frame 44 there is mounted a supporting bar 46 carrying a sealing strip 47 which extends from the front frame 44 to the rear frame and holds the sealing strip 47 against or in close running relationship to the bottom of the wire 11 for removing excess water therefrom. Mounted near the top of the frame 44 (and obviously within the loop of the wire 11) is a pivot pin 48, which in turn mounts one end 49*a* of a swingable arm 49 that extends outwardly in the general direction in which the frame 44 extends.

Referring now to Figure 1, which shows the operating position for the instant device, it will be seen that the arm 49 extends generally horizontally from the pivotal mounting at 48 to an upright frame indicated generally at 50. The frame 50 carries a mounting block 51 firmly affixed to the frame 50 and carrying a sliding block 52. A set screw and lock nut assembly at 53 mounted near the bottom of the mounting block 51 coacts with the sliding block 52 to fix the position of the sliding block 52. The sliding block 52 carries a hanger 55 which extends downwardly through a sleeve-like portion 52*a* of the movable block and is held in the sleeve by a lock nut 56. The hanger 55 has an eye at the bottom 55*a* thereof which receives a pin 57 (as better shown in Figure 2) carried by an ear-shaped member 58 that is detachably secured to the outwardly extending end 49*b* of the arm 49. For reasons which will be explained hereinafter, the ear 58 is suitably secured to the outwardly extending end 49*b* of the arm 49 by bolts or a sliding dove-tail connection (as shown at 59) or some other suitable means which will permit the ear 58 to be readily detached from the arm 49. It will be seen that the frame 50 and the various mounting blocks 51 and 52 thereon are outside the loop of the wire 11, and the ear 58 is also outside this loop. As shown in Figure 8, the ear 58 is removed from the arm 49 during wire replacement (the ear 58 being shown diagrammatically only in Figure 8) and this will be explained in greater detail hereinafter.

The ear 58 is also attached to a chain 60 suitably secured to the top of the ear 58. The chain 60 is trained over the top of an upper turning roll 61 mounted rotatably on the frame 50 and then downwardly along the frame 50 to a bottom turning roll 62 mounted rotatably near the bottom of the frame 50 and suitably equipped with means for drivingly rotating the roll 62, such as a crank 63 for manually rotating the roll 62 (or a suitable motor and gearing, not shown). The movement of the chain 60 by the driven rotation of the roll 62 causes swinging movement of the arm 49 when the pin 57 has been withdrawn from the hanger eye 55*a*. In this way, the arm 49 with the ear 58 attached thereto may be swung downwardly as shown in Figure 2 or the arm 49 may be swung upwardly so that the pin 57 may be engaged with the hanger 55, as shown in Figure 1, for the operating position of the device. Fine adjustment of the exact position of the arm 49 is accomplished by means of the set screw and lock nut assembly 53.

Referring now to other features of the mounting of the upright frame 50, it will be noted first that the upright frame 50 shown in Figures 1 and 2 is the portion of the

machine for the front side adapted to mount the various devices carried thereby on the front side of the machine, and a similar but symmetrical frame arrangement is provided on the back side of the machine. The instant frame **50** is thus positioned outside the loop of the wire **11** and also on the front side of the line of travel of the wire **11** as well as the overrunning felt **64**. As those skilled in the art will appreciate, the overrunning felt **64** presents a lower run (which is the portion of the felt **64** shown in Figures 1 and 2) which extends above the top of a plurality of individual units, each having the structural arrangement as shown in Figures 1 or 2, so that the fibrous web which is formed on the wire **11** beginning at the inlet **37** may be carried from the offrunning side of the cylinder **12** on the upper run **11***a* of the wire **11** to the couch roll **13**, whereat the web W carried by the wire **11** is brought into contact with the overrunning looped felt **64** and transfer of the web to the felt **64** is effected. By the use of a plurality of units such as the unit **10**, it is possible to obtain a plurality of layers of webs traveling along on the bottom side of the felt **64**, which ultimately serve to form a multi-ply layer of paper.

An overhead pickup roll **65** is ordinarily provided within the loop of the pickup felt **64** to assist in effecting transfer of the web W to the underside of the felt **64**. The pickup roll **65** is ordinarily a suction roll, but the particular details of its operation are well understood by those skilled in the art and need not be described in further detail herein. The particular manner in which the pickup roll **65** is mounted in the instant apparatus is, however, of importance in the instant invention. It will be noted that the frame **50** is pivotally connected at **66** to a swinging arm **67** which extends across the front of the frame **50** and back beyond the pickup roll **65**. The arm **67** is pivotally mounted on the frame **50** at one end **65***a* thereof and is pivotally engaged at the other end **67***b* to an adjusting arm **68**. The adjusting arm **68** is mounted at its top (not shown) to suitable frame work in the machine itself and the arm **68** swings downwardly therefrom. The depending arm **68** functions as an adjustable hanger for the arm **67**, having an axially movable sleeve **68***a* pivotally connected to the extending end **67***b* of the arm **67** at **69**. The sleeve **68***a* is moved axially with respect to the arm **68** by rotation of the crank member **70** which is threadedly engaged with the arm **68**.

The pickup roll **65** is rotatably mounted on front and rear bearings **71***a* and **71***b* (respectively) the front bearing **71***a* is carried by a slidable block **72** suitably mounted in grooves at *g* in the central portion of the arm **67**. The slidable block **72** permits positioning of the pickup roll **65** by movement in a horizontal plane, whereas the adjustable hanger assembly **68** permits vertical movement of the pickup roll **65**. It will be noted that the movement of the couch roll **13** which cooperates with the pickup roll **65** to effect web transfer from the wire **11** to the felt **64** is limited essentially to an arcuate motion that is primarily in a vertical plane, such motion being defined by the movement of the arm **49** as it swings about the pivot **48** (and the cylinder **12**). The plane in which the nip N defined by the couch roll **13** and the pickup roll **65** will lie is thus adjustably defined by the horizontal (and to some extent the vertical) movement of the pickup roll **65**. It will be appreciated that some adjustment of the plane of the nip N is also provided by the swinging movement of the couch roll **13**, although the greatest amount of adjustment is provided by the twofold positional adjustment for the pickup roll **65**. This is advantageous for a number of reasons. First of all, the movement of the couch roll **13** is simplified and reduced primarily to that of a swinging movement, whereby the single movement of the couch roll **13** not only will move the couch roll out of operating position downwardly but also will bring the couch roll **13** and the cylinder **12** together so that the wire **11** will hang loosely thereover, to assist in wire replacement or removal. The provision of this simplified motion for the couch roll **13** coupled with the twofold adjustment for the pickup roll **65** thus provides for maximum flexibility in operation in that the plane of the nip may be altered extensively and also the rate of incline of the upper run **11***a* of the wire **11** may be altered, so as to effect optimum operating conditions for any particular type of web W.

Referring now to certain details of the structure within the loop of the wire **11**, it will be seen that the bearings **17** for the couch roll **13** are suitably positioned in and carried by the arm **49** near the outer end **49***b* thereof. A depending supporting means in the form of an arm **73** is mounted swingably about the arm **49** and, being carried by the arm **49**, swingably about the cylinder **12**. The depending arm **73** is pivotally connected to the arm **49**, being mounted swingably about the bearing **17** for the couch roll **13** and extending downwardly therefrom to carry the bearing **18** for the turning roll **14** at the lower extremity **73***a* of the arm **73**. At the lower extremity **73***a* of the arm there is provided a horizontally slidable block **74** whose horizontal movement is limited by lock nuts **75**, **75** and which is carried in a groove at the bottom **73***a* of the arm **73**. The block **74** actually houses the bearing **18** for the turning roll **14**. Movement of the block **74** carrying the turning roll **14** is used to effect tensioning of the wire **11** to the desired extent. An additional tensioning roll **15** is also carried near the middle of the arm **73**. The tensioning roll **15** has bearings **76** suitably mounted in an adjustable bearing block **77** that is carried by the depending arm **73**. The adjusting arrangement (not shown) for the bearing block **77** may be any of a number of suitable arrangements as those skilled in the art will appreciate. Also, provision may be made for adjustment of the roll **15** in a horizontal direction as well as the adjustment in the vertical direction here indicated. In addition, it will be appreciated that the roll **15** may be retained in fixed position and the entire tensioning adjustment may be effected by movement of the block **74**, hereinbefore described. It will also be noted that suitable hangers are provided at various locations in the device for spreader poles, indicated at *a*, *b* and *c*, whose function will be described hereinafter. Such hangers include a hanger on the cylinder frame **44** at **78** for the spreader pole *a*, a hanger **79** on the movable block **74** for the spreader pole *b* and a hanger **80** near the roll **15** on the depending arm **73**.

Swinging movement of the depending arm **73** is provided for by a pinion gear **81** mounted on the arm **49** and cooperating with a spur gear segment **82** carried by the depending arm **73**. Rotation of the pinion gear **81** by suitable motor or manual means (not shown) effects swinging movement of the depending arm **73** with respect to the horizontal arm **49** and the angular relationship between the arms **49** and **73** is controlled by the pinion and spur gear assembly **81–82**.

Referring now to Figures 5, 6, 7 and 8, which show the sequence of steps involved in shutting a unit **10** down and changing the wire thereon, it will be noted that Figure 5 shows (diagrammatically) the general positional relationship between the cylinder **12**, turning roll **14** and couch roll **13** in operating position, the felt **64** just touching the top of the wire covered couch roll **13**. The chain **60** is shown in Figure 5 as the sole support for the outer end of the arm **49**, and the blocks **51** and **52** are not shown for the purpose of simplifying the drawing. The first step is preferably of a preliminary nature so as to just barely effect a complete separation of the felt **64** and the wire **11** turning over the top of the couch roll **13**. This might be done by lifting the pickup roll **65** slightly or it might be done by lowering the couch roll **13** slightly (which could be done either by slight adjustment of the set screw assembly **53** or by pulling the pin **57** and lowering the chain **60** slightly). The stock flow at the inlet **26** is, of course, cut off at this time also.

Next, the steps of swinging the turning roll **14** and couch roll **13** toward the cylinder **12** are undertaken. Preferably, the first step in this operation involves turning

the pinion 81 so as to swing the turning roll 14 back toward the cylinder 12 and into the position indicated in Figure 6. This causes some slackening of the wire 11 as indicated in Figure 6 and this results in a new angular relationship between the arms 49 and 73. Next, with the pinion 81 holding the angular relationship between the horizontal arm 49 and the depending arm 73, the chain 60 is lowered by rotation of the turning roll 62 until the arm 49 has swung downwardly a predetermined distance. This distance may be fixed by a number of ways, but preferably it is fixed by a stop indicated at 83 mounted on the cylinder bearing supporting means 16. In Figure 1, and Figure 2, the stop means are in the form of a wall 83 at the back of the bar 46 which coacts with a ledge 84 on the bottom of the arm 49. A linking arm 85 (shown best in Figures 1 and 2), is pivotally connected to the bottom of the frame 44 at 86, and the linking arm 85 is swung out slightly to engage a lock nut 87 that secures the free end of the linking arm 85 to the lower end of the depending arm 73. The linking arm 85 is employed to relieve the pinion gear 81 from holding the depending arm 73 in the position shown in Figure 7. In the position shown in Figure 7, the cylinder 12, couch roll 13 and turning roll 14 are bunched together and the wire is slackened, so that it may be removed most easily. The next steps involve additional strengthening of the overall support for these rolls as well as the removal of certain supporting means to permit removal of the wire 11.

The stock inlet 26 is, of course, rolled back to the left on the track 41 to the position shown in Figure 8. Also, the front column 21 supporting the front bearing housing for the cylinder 12 is removed, as is shown in Figure 8, so that the wire 11 may pass underneath the bearing housing 16. The ear 58 attached to the outer end of the arm 49 and connected to the chain 60 must be disconnected from the arm 49 in order to permit the wire 11 to pass over the couch roll bearings 17. At this point, the rear support column 22 for the cylinder 12 cantileverly supports the cylinder 12 and also the remainder of the supporting means for the couch roll 13 and the turning roll 14. The arms 49 cooperating with the stop 83 tend to cantileverly support the couch roll 13; and the linking arm 85 assists in supporting the turning roll 14. The instant assembly is suitable in certain cases where relatively small elements may be employed, but it is preferable to employ an additional supporting means which is indicated at 88 in Figures 5, 6, 7 and 8 diagrammatically and somewhat in more detail in Figures 4 and 10. The support means 88 is in the form of a supporting column which presents a bearing saddle for the rear couch roll bearing 17; and the bearing saddle 88*a* is situated at the level at which the bearing 17 will be lowered during shut down of the device. Clamping means 89 in the form of a yoke which may be swung over the top of the bearing 17 and a large locking bolt 90 are provided for securing the bearing 17 in position and the column 88 is provided with counter-balancing anchoring means 91 which effectively support the column 88 to provide for cantileverly supporting the couch roll 13.

As will also be noted from Figure 8, the ear 58 is disconnected from the arm 49, after the linking bar 85 has been connected and the couch roll bearing 17 has been secured by the clamping means 89 to the rear support column 88. The assembly 10 of Figure 8 is thus in position for the changing of the wire 11, as soon as the front column 21 supporting the cylinder bearing housing 16 has been removed. This also is shown in Figure 8.

The next steps involve the movement of the wire changer or wire carrier, indicated generally by the reference numeral 92 in Figure 3. The wire carrier 92 comprises a front and rear inverted U-shaped member, only the rear member 93*b* being shown in Figures 3 and 4 and the front member 93*a* being shown in Figure 8. Referring to Figures 3 and 4, wherein Figure 3 shows the carrier 92 alone and Figure 4 shows the carrier 92 in position for stringing the wire 11, it will be noted that the inverted U-shaped members 93*a* and 93*b* may be suitably made of ordinary pieces of pipe and pipe fittings as shown, with a short drop leg 94 at one side connected by means of an elbow 95 to a cross piece 96. The cross piece 96, short drop leg 94 and elbow 95 are positioned so as to provide substantially a right angle between the cross piece 96 of the drop leg 94 and this portion of the carrier 92 extends up and over the lowered couch roll 13, as indicated in Figure 4. A second longer drop leg 97 is provided on the other side of the carrier 92 and extends upwardly to a 45° elbow 98 which connects to a short straight piece 99 which in turn is connected to the cross piece 96 by means of the 45° elbow 100. The structure involving the 45° elbows 100 and 98 and the short pipe link 99 is arranged so as to fit around the cylinder 12 as closely as possible, as shown in Figure 4. Connecting bars 101 and 102 are suitably affixed to the top of the cross piece 96 and extend perpendicularly therefrom in general parallel alignment to the top of the corresponding member in the front inverted U-shaped member 93*a* of the carrier 92, so as to maintain the pair of inverted U-shaped members 93*a* and 93*b* in spaced relationship.

A plurality of spreader poles 103, 104, 105, 106 and 107 are suitably mounted in hangers 108, 109, 110, 111 and 112, respectively, which permit manual removal of each of the spreader poles.

In assembling the carrier 32 with a new wire 11' in the position shown in Figure 3, prior to stringing the new wire 11' onto the rolls in the unit, the wire is looped over a pair of spreader poles, such as the poles 104 and 105 and carried with the poles 104 and 105 in spaced relationship underneath the inverted U-shaped members 93*a* and 93*b*, and then the poles 104 and 105 are slipped into their respective hangers 109 and 110. The remaining spreader poles 103, 106 and 107 are then slipped through the open slack loop of the wire 11' and moved up to their respective hangers 108, 111 and 112, so that the loop of the wire 111 is effectively spread out to carry over the rolls of the unit, as shown in Figure 4. In connection with movement of the carrier 92, it will be appreciated that means (not shown) are provided for movement of the carrier 92 longitudinally of the paper machine. Such means could include an overhead hoist arrangement attached to the cross bars 101 and 102 affixed to the top member 96 of each of the inverted U-shaped members 93*a* and 93*b*, as at 113 and 114 in Figure 4. The nature of such overhead carrier means is indicated clearly in Lloyd Hornbostel Patent No. 2,473,100, issued June 14, 1949, and need not be further described herein. It is sufficient to note that the overhead carrier means are provided primarily for movement of the instant carrier 92 longitudinally of the paper machine on the front side thereof. If Figures 5 and 6, for example, are considered to show two units 10, 10 positioned in succession for operation with the same overhead felt 64, it will be seen in general how the individual units are aligned in the cylinder-mold type machine, and the overhead carrier means is provided for moving the carrier 92 into alignment with any given unit 10.

Means providing for lateral movement of the carrier 92, or movement axially of the cylinder 11, are also provided in the form of track and roller assemblies 115 and 116. Referring to the roller and track assembly 115 which is located at the bottom of the shorter drop leg 94 of the inverted U-shaped member 93*b* shown in Figure 4, it will be seen that this assembly comprises a roller 117 that is centrally grooved so as to fit on an inverted V-shaped track 118 which extends laterally of the machine, the roller 117 being grooved so as to remain in alignment with the track 118 during movement therealong, and the roller 117 being rotatably mounted in a housing 119 formed at the bottom of the short drop leg 94.

The track 118 may be mounted in a number of different

ways. The principal feature of the track 118 being that it is positioned below the rolls 13 and 14 and the cylinder 12 and it supports from beneath the drop leg 94. It will be appreciated that there is very little space between the overrunning felt 64 and the tops of the cylinder 12 and the couch roll 13 wherein suitable sliding means such as a track could be positioned for carrying the carrier 92. In contrast, the instant arrangement is particularly advantageous, because it provides for a relatively sturdy track and roller assembly which is suitably positioned where space is available. It will also be understood that the overhead carrying means indicated, for example, at the chain links 113 and 114 must be detachable in order to permit lateral movement of the carrier 92 without interference with the traveling felt 64. The supporting means for the track 118 may be removable or permanent, and such supporting means might take the form of the rack 120 of Figure 4 suitably secured to the floor F and extending upward to provide a groove 121 which receives the track 118. Rack mounting means 120 can be provided thus for both ends of the track 118, and such mounting means may be permanently retained in position, because no operating parts move through the position wherein the track 118 and the support 120 therefor are positioned. On the other side of the carrier 92, however, the longer drop leg 97 terminates with a roller and track assembly 116 which is the same in structure as that shown for 115. In this case, a suitable supporting means 122 may be provided with an upturned groove 123 which removably receives the track 124 of the assembly 116. Supporting means 122 may be provided directly beneath the front and rear cylinder bearings 19*a* and 19*b*, and immediately adjacent the base supports 23 and 24, respectively, but such mounting means 122, 122 must provide for removably receiving the track 124, because the track 124 extends across the location which will be occupied by the inlet 26 during operation. For this reason, the track 124 is a removable unit. Also, it will be appreciated that the tracks 124 and 118 extend outwardly from the front of the unit a substantial distance so that the front and back inverted U-shaped members 93*a* and 93*b* may be both brought to rest upon the tracks 118 and 124 prior to starting the movement of the carrier 92 from the front side of the cylinder 12, as shown in Figure 9, inwardly.

In removing the wire 11 from the unit 10, as shown in Figure 4 (and in Figure 8), the carrier 92 is moved into position and placed upon the tracks 118 and 124 in the front of the unit wherein the wire 11 is to be replaced, and the carrier 92 without the spreader poles mounted thereon is rolled inwardly so as to extend substantially completely over the cylinder 12 and couch roll 13. Then spreader poles such as the upper poles 104 and 105 are slipped in underneath the wire 11 and just over the arm 49, and the spreader poles are then lifted upwardly into their respective hangers 109 and 110, so as to pick the wire 11 up off the cylinder 12 and couch roll 13. Then the remaining spreader poles are slipped through the wire loop and moved over to their respective hangers. Then the carrier 92 is rolled back out in front of the unit again to remove the wire 11 from the unit. A second carrier 92 may then be moved in position with a new wire 11′ thereon, or the wire 11 that is being replaced may be taken off the rack 92 on spreader poles and another wire 11′ positioned on the carrier 92 as described.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

I claim as my invention:

1. In a cylinder-mold paper machine, in combination, a looped forming wire, a cylinder, a couch roll and a turning roll, all positioned within the loop of the wire and maintaining the wire in tensioned operating position, mounting means rotatably supporting the cylinder, first bearing means rotatably carrying the couch roll, and second bearing means rotatably carrying the turning roll, at least one of said bearing means being mounted swingably about a point within said wire loop on said cylinder mounting means to effectively swing the roll carried thereby in and out of its position for maintaining the wire in tensioned operating position.

2. In a cylinder-mold paper machine, in combination, a looped forming wire, a cylinder, a couch roll and a turning roll, all positioned within the loop of the wire and maintaining the wire in tensioned operating position, mounting means rotatably supporting the cylinder, first bearing means rotatably carrying the couch roll, and second bearing means rotatably carrying the turning roll, each of said bearing means being mounted swingably about a point within said wire loop on said cylinder mounting means to effectively swing the roll carried thereby in and out of its position for maintaining the wire in tensioned operating position.

3. In a cylinder-mold paper machine, in combination, a looped forming wire, a cylinder within the loop of said wire and rotatably mounted on bearings, first support means carrying the cylinder bearings, a couch roll within the loop of said wire and rotatably mounted on bearings above the cylinder, second support means swingable about a point within said wire loop on the first support means and carrying the couch roll bearings, a turning roll within the loop of said wire and rotatably mounted on bearings below the couch roll, and third support means swingable about the first support means and carrying the turning roll bearings.

4. In a cylinder-mold paper machine, in combination, a looped forming wire, a cylinder within the loop of said wire and rotatably mounted on bearings, first support means carrying the cylinder bearings, a couch roll within the loop of said wire and rotatably mounted on bearings above the cylinder, second support means swingable about a point within said wire loop on the first support means and carrying the couch roll bearings, a turning roll within the loop of said wire and rotatably mounted on bearings below the couch roll, and third support means swingable about the second support means and carrying the turning roll bearings.

5. In a cylinder-mold paper machine, in combination, a looped forming wire, a cylinder within the loop of said wire and rotatably mounted on bearings, first support means carrying the cylinder bearings, a couch roll within the loop of said wire and rotatably mounted on bearings above the cylinder, second support means pivotally connected within the loop of said wire to the first support means and carrying the couch roll bearings, a turning roll within the loop of said wire and rotatably mounted on bearings below the couch roll, and third support means pivotally connected to the second support means and carrying the turning roll bearings.

6. In a cylinder-mold paper machine, in combination, a looped forming wire, a cylinder within the loop of said wire and rotatably mounted on bearings, first support means carrying the cylinder bearings, a couch roll within the loop of said wire and rotatably mounted on bearings above the cylinder, second support means swingable about a point within said wire loop and on the first support means and carrying the couch roll bearings, movable means connected to said second support means for selectively swinging the same in and out of a predetermined position and cooperating with said first support means to carry said second support means, a turning roll within the loop of said wire and rotatably mounted on bearings below the couch roll, and third support means swingable about the first support means and carrying the turning roll bearings.

7. In a cylinder-mold paper machine, in combination, a looped forming wire, a cylinder within the loop of said wire and rotatably mounted on bearings, first support means carrying the cylinder bearings, a couch roll within

the loop of said wire and rotatably mounted on bearings above the cylinder, second support means pivotally connected within the loop of said wire at one end to the first support means and carrying the couch roll bearings, a frame positioned outside the loop of said wire, movable means carried by said frame and detachably connected to the other end of said second support means for selectively swinging the same in and out of a predetermined position and cooperating with said first support means to carry said second support means, a turning roll within the loop of said wire and rotatably mounted on bearings below the couch roll, and third support means pivotally connected to the second support means and carrying the turning roll bearings.

8. In a cylinder-mold paper machine, in combination, a looped forming wire, a pickup felt traveling above said wire, a cylinder within the loop of said wire and rotatably mounted on bearings, first support means carrying the cylinder bearings, a couch roll within the loop of said wire and rotatably mounted on bearings above the cylinder, second support means swingable about a point within the loop of said wire on the first support means and carrying the couch roll bearings, said second support means selectively swinging said couch roll with the wire thereover upwardly into contact with said pickup felt and downwardly out of contact therewith, a turning roll within the loop of said wire and rotatably mounted on bearings below the couch roll, and third support means swingable about the first support means and carrying the turning roll bearings.

9. In a cylinder-mold paper machine, in combination, a looped forming wire adapted to form a fibrous web thereon, a looped pickup felt traveling above said wire, a pickup roll within the loop of said felt and cooperating therewith to effect transfer of the web from the wire to the felt, a cylinder within the loop of said wire and rotatably mounted on bearings, a first support means carrying the cylinder bearings, a couch roll within the loop of said wire and rotatably mounted on bearings above the cylinder and selectively raising said wire against the felt covered pickup roll to effect web transfer and lowering said wire away from the felt to prevent web transfer, second support means pivotally connected within the loop of said wire to the first support means and carrying the couch roll bearings for swinging the couch roll through the raising and lowering movement thereof, a turning roll within the loop of said wire and rotatably mounted on bearings below the couch roll, and third support means swingable about the first support means and carrying the turning roll bearings.

10. In a cylinder-mold paper machine, in combination, a looped forming wire adapted to form a fibrous web thereon, a looped pickup felt traveling above said wire, a pickup roll within the loop of said felt and cooperating therewith to effect transfer of the web from the wire to the felt, a cylinder within the loop of said wire and rotatably mounted on bearings, a first support means carrying the cylinder bearings, a couch roll within the loop of said wire above the cylinder and selectively raising said wire against the felt covered pickup roll to effect web transfer and lowering said wire away from the felt to prevent web transfer, and second support means pivotally connected within the loop of said wire to the first support means and carrying the couch roll bearings for swinging the couch roll through the raising and lowering movement thereof.

11. In a cylinder-mold paper machine, in combination, a pickup felt, a plurality of aligned cylinder mold units underlying said felt, each unit comprising a looped forming wire, a cylinder within the loop of said wire, a stock inlet flowing stock onto the wire covered cylinder to form a fibrous web upon the wire, a couch roll within the loop of said wire, a support rotatably mounting the cylinder, an arm pivotally mounted within the loop of said wire on said support and rotatably carrying said couch roll and movable means connected to said arm selectively swinging the arm upwardly to urge the couch roll and wire looped thereover into engagement with the felt to effect web transfer from the wire to the felt and swinging the arm downward to prevent such web transfer.

12. In a cylinder-mold paper machine, in combination, a looped forming wire presenting an upper run adapted to form and carry a traveling web thereon, a cylinder within the loop of said wire for cooperating therewith at the forward end of said run to form a web, a suction-roll within the loop of said felt and acting therethrough to pick up the web from the rear end of said wire run and transfer the web to the felt, a couch roll within the loop of said wire, a support rotatably mounting the cylinder, an arm pivotally mounted at one end within the loop of said wire and rotatably carrying the couch roll, a frame, first movable means carried by said frame connected to the other end of said arm for swinging the couch roll selectively upwardly to urge the couch roll covered by the wire into nip defining relationship with the suction roll covered by the felt for web transfer and downwardly out of such nip defining relationship, and second movable means carried by said frame and rotatably carrying said suction roll to alter the plane of the nip defined with the couch roll.

13. In a cylinder-mold paper machine, in combination, a pickup felt, a looped forming wire presenting an upper run adapted to form and carry a traveling web thereon, a cylinder within the loop of said wire for cooperating therewith at the forward end of said run to form a web, a suction-roll within the loop of said felt and acting therethrough to pick up the web from the rear end of said wire run and transfer the web to the felt, a couch roll within the loop of said wire, a support rotatably mounting the cylinder, an arm pivotally mounted at one end within the loop of said wire and rotatably carrying the couch roll, first movable means connected to the other end of said arm for swinging the couch roll selectively upwardly to urge the couch roll covered by the wire into nip defining relationship with the suction roll covered by the felt for web transfer and downwardly out of such nip defining relationship, and second movable means rotatably carrying said suction roll to alter the plane of the nip defined with the couch roll.

14. In a cylinder-mold paper machine, in combination, a pickup felt, a looped forming wire presenting an upper run adapted to form and carry a traveling web thereon, a cylinder within the loop of said wire for cooperating therewith at the forward end of said run to form a web, a suction-roll within the loop of said felt and acting therethrough to pick up the web from the rear end of said wire run and transfer the web to the felt, a couch roll within the loop of said wire, a support rotatably mounting the cylinder, an arm pivotally mounted at one end within the loop of said wire and rotatably carrying the couch roll, vertically moving means connected to the other end of said arm for swinging the couch roll selectively upwardly to urge the couch roll covered by the wire into nip defining relationship with the suction roll covered by the felt for web transfer and downwardly out of such nip defining relationship, and horizontally moving means rotatably carrying said suction roll to alter the plane of the nip defined with the couch roll.

15. In a cylinder mold paper machine, in combination, a pickup felt, a looped forming wire presenting an upper run adapted to form and carry a traveling web thereon, a cylinder within the loop of said wire for cooperating therewith at the forward end of said run to form a web, a suction-roll within the loop of said felt and acting therethrough to pick up the web from the rear end of said wire run and transfer the web to the felt, a couch roll within the loop of said wire, a support rotatably mounting the cylinder, an arm pivotally mounted at one end within the loop of said wire and rotatably carrying the couch roll and vertically moving means connected to the other end of

said arm for swinging the couch roll selectively upwardly to urge the couch roll covered by the wire into nip defining relationship with the suction roll covered by the felt for web transfer and downwardly out of such nip defining relationship.

16. In a cylinder-mold paper machine, in combination, a cylinder rotatably mounted on bearings, support means for the cylinder bearings, swingable means pivotally connected to said support means, a couch roll rotatably carried by said swingable means and movable therewith upwardly and downwardly, stop means on said support means limiting the downward movement of the couch roll, means cooperating with said stop means to cantileverly support said swingable means and couch roll carried thereby, and a mover detachably connected to said swingable means for effecting such upward and downward movement of the couch roll.

17. In a cylinder-mold paper machine, in combination, a cylinder rotatably mounted on bearings, support means for the cylinder bearings, swingable means pivotally connected to said support means and extending outwardly therefrom, a couch roll and a turning roll therebeneath rotatably carried by said swingable means in the outwardly extended portion thereof and movable therewith upwardly and downwardly, stop means on said support means limiting the downward movement of the swingable means, said stop means cooperating with said support means to cantileverly carry the weight of the swingable means, turning roll and couch roll, and a mover detachably connected to said swingable means for effecting such upward and downward movement of the couch roll.

18. In a cylinder-mold paper machine, in combination, a cylinder rotatably mounted on bearings, support means for the cylinder bearings, an arm extending outwardly from said support means and pivotally connected to said support means, a first mover detachably connected to the outer extremity of said arm to selectively raise and lower the arm, a couch roll rotatably carried by the arm, a turning roll, a member pivotally connected to said arm and depending therefrom rotatably carrying the turning roll below the couch roll, a second mover at the pivot connection of said member for swinging said member and the turning roll carried thereby about the pivot connection and a linking bar swinging from said support and detachably connectable to said member, when said arm and said member are swung downwardly and toward said cylinder.

19. In a cylinder-mold paper machine, in combination, a cylinder rotatably mounted on front and rear bearings, front and rear bearing housings therefor, front and rear bearing blocks supporting the housings, the front bearing block being removable for opening up a gap facilitating passage of a forming wire, means cooperating with the rear bearing block to cantileverly support the cylinder when the front bearing block is removed, a couch roll rotatably mounted on bearings, support means pivotally connected to the housings and swingably carrying the couch roll bearings, stop means on the housings for limiting the downward swing of said support means and cantileverly supporting said support means, a movable wire carrier, means suspending the carrier over the top of the cylinder and the couch roll for movement laterally of the machine, and spreader poles on said carrier for holding the forming wire on the carrier in an open depending loop large enough to freely encompass the cylinder and the couch roll when the support means are swung downwardly against the stop means.

20. In a cylinder-mold paper machine, in combination, a cylinder rotatably mounted on front and rear bearings, front and rear bearing housings therefor, front and rear bearing blocks supporting the housings, the front bearing block being removable for opening up a gap facilitating passage of a forming wire, means cooperating with the rear bearing block to cantileverly support the cylinder when the front bearing block is removed, a couch roll rotatably mounted on bearings, support means pivotally connected to the housings and swingably carrying the couch roll bearings, an adjusting device connected to said support means to effect upward and downward swinging movement of said couch roll, stop means on the housings for limiting the downward swing of said support means and cantileverly supporting said support means, a movable wire carrier, means suspending the carrier over the top of the cylinder and the couch roll for movement laterally of the machine, and spreader poles on said carrier for holding the forming wire on the carrier in an open depending loop large enough to freely encompass the cylinder and the couch roll when the support means are swung downwardly against the stop means.

21. In a cylinder-mold paper machine, in combination, a cylinder rotatably mounted on front and rear bearings, front and rear bearing housings therefor, front and rear bearing blocks supporting the housings, the front bearing block being removable for opening up a gap facilitating passage of a forming wire, means cooperating with the rear bearing block to cantileverly support the cylinder when the front bearing block is removed, a couch roll rotatably mounted on bearings, a pair of supporting arms each pivotally connected to one of said housings at one end and extending outwardly therefrom to receive a couch roll bearing adjacent the other end, locking means detachably connected to the outer ends of said arms to retain the same in fixed position, an adjusting device also connected to the outer ends of said arms for movement thereof when the locking means are detached, stop means limiting the downward swing of said arms and cantileverly supporting the same, a movable wire carrier, means suspending the carrier over the top of the cylinder and the couch roll for movement laterally of the machine, and spreader poles on said carrier for holding the forming wire on the carrier in an open depending loop large enough to freely encompass the cylinder and the couch roll when the arms are swung down against the stop means.

22. In a cylinder-mold paper machine, in combination, a cylinder rotatably mounted on front and rear bearings, front and rear bearing housings therefor, front and rear bearing blocks supporting the housings, the front bearing block being removable for opening up a gap facilitating passage of a forming wire, means cooperating with the rear bearing block to cantileverly support the cylinder when the front bearing block is removed, a couch roll rotatably mounted on bearings, a pair of supporting arms each pivotally connected to one of said housings at one end and extending outwardly therefrom to receive a couch roll bearing adjacent the other end, locking means detachably connected to the outer ends of said arms to retain the same in fixed position, an adjusting device also connected to the outer ends of said arms for movement thereof when the locking means are detached, stop means limiting the downward swing of said arms and cantileverly supporting the same, depending members mounted pivotally about the couch roll bearings, a turning roll rotatably mounted on bearings carried by the lower ends of said depending members, gear means interconnecting said depending members and said arms for effecting relative swinging movement therebetween, linking means detachably connecting the housing with the lower ends of the depending members when said arms are resting on said stop means, a movable wire carrier, means suspending the carrier over the top of the cylinder and the couch roll for movement laterally of the machine, and spreader poles on said carrier for holding the forming wire on the carrier in an open depending loop large enough to freely encompass the cylinder and the couch roll when the arms are swung down against the stop means.

23. In a cylinder-mold paper machine, in combination, a cylinder rotatably mounted on front and rear bearings, front and rear bearing housings therefor, front and rear

bearing blocks supporting the housings, the front bearing block being removable for opening up a gap facilitating passage of a forming wire, means cooperating with the rear bearing block to cantileverly support the cylinder when the front bearing block is removed, a couch roll rotatably mounted on bearings, a pair of supporting arms each pivotally connected to one of said housings at one end and extending outwardly therefrom to receive a couch roll bearing adjacent the other end, locking means detachably connected to the outer ends of said arms to retain the same in fixed position, an adjusting device also connected to the outer ends of said arms for movement thereof when the locking means are detached, stop means limiting the downward swing of said arms and cantileverly supporting the same, pedestal means aligned with the rear cylinder bearing block and beneath the corresponding couch roll bearing for receiving such couch roll bearing and cantileverly supporting the couch roll when said arms are lowered against said stop means, a movable wire carrier, means suspending the carrier over the top of the cylinder and the couch roll for movement laterally of the machine, and spreader poles on said carrier for holding the forming wire on the carrier in an open depending loop large enough to freely encompass the cylinder and the couch roll when the arms are swung down against the stop means.

24. In a cylinder-mold paper machine, in combination, a cylinder rotatably mounted on front and rear bearings, front and rear bearing housings therefor, front and rear bearing blocks supporting the housings, the front bearing block being removable for opening up a gap facilitating passage of a forming wire, means cooperating with the rear bearing block to cantileverly support the cylinder when the front bearing block is removed, a couch roll rotatably mounted on bearings, a pair of supporting arms each pivotally connected to one of said housings at one end and extending outwardly therefrom to receive a couch roll bearing adjacent the other end, locking means detachably connected to the outer ends of said arms to retain the same in fixed position, an adjusting device also connected to the outer ends of said arms for movement thereof when the locking means are detached, stop means limiting the downward swing of said arms and cantileverly supporting the same, pedestal means aligned with the rear cylinder bearing block and beneath the corresponding couch roll bearing for receiving such couch roll bearing and cantileverly supporting the couch roll when said arms are lowered against said stop means, depending members mounted pivotally about the couch roll bearings, a turning roll rotatably mounted on bearings carried by the lower ends of said depending members, gear means interconnecting said depending members and said arms for effecting relative swinging movement therebetween, linking means detachably connecting the housing with the lower ends of the depending members when said arms are resting on said stop means, a movable wire carrier, means suspending the carrier over the top of the cylinder and the couch roll for movement laterally of the machine, and spreader poles on said carrier for holding the forming wire on the carrier in an open depending loop large enough to freely encompass the cylinder and the couch roll when the arms are swung down against the stop means.

25. In a cylinder-mold paper machine, in combination, a looped forming wire, a cylinder within the loop of said wire and rotatably mounted on bearings, a portion of said first support means under one of the cylinder bearings being removable to open a gap to pass the wire therethrough, a couch roll within the loop of said wire and rotatably mounted on bearings above the cylinder, second support means pivotally connected to and swingable about a point on the first support means within the loop of said wire and carrying the couch roll bearings, a frame outside the wire loop, adjusting means mounted on the frame and detachably connected to the second support means for selectively swinging the second support means upwardly and downwardly, and stop means mounted on said first support means limiting the downward swing of the second support means and cantileverly supporting the second support means when the adjusting means are detached therefrom.

26. In a cylinder-mold paper machine, in combination, a looped forming wire, a cylinder within the loop of said wire and rotatably mounted on bearings, a portion of said first support means under one of the cylinder bearings being removable to open a gap to pass the wire therethrough, a couch roll within the loop of said wire and rotatably mounted on bearings above the cylinder, second support means pivotally connected to and swingable about a point on the first support means within the loop of said wire and carrying the couch roll bearings, a turning roll within the loop of said wire and rotatably mounted on bearings below the couch roll, third support means swingable about and pivotally connected to said second support means and carrying the turning roll bearings, a frame outside the wire loop, adjusting means mounted on the frame and detachably connected to the second support means for selectively swinging the second support means upwardly and downwardly, and stop means mounted on said first support means limiting the downward swing of the second support means and cantileverly supporting the second support means when the adjusting means are detached therefrom.

27. In a cylinder-mold paper machine, in combination, a plurality of separate looped forming wires, a cylinder within the loop of each of said forming wires for effecting fibrous web formation on the wire, a looped pickup felt having a felt run positioned above the upper run of each of said forming wires to receive the fibrous web therefrom, a couch roll within the loop of each of said forming wires, first support means rotatably mounting each cylinder, a frame outside the loop of each of said forming wires, second support means pivotally connected to and swingable about a point on each of said first support means within the loop of the wire associated therewith and carrying each of said couch rolls for selectively swinging the couch roll upwardly above the cylinder associated therewith to direct the upper run of each forming wire against the felt run to permit web transfer and downwardly below the cylinder to prevent web transfer from the wire to the felt, and locking means detachably securing each of said second means to the frame associated therewith in the upward position thereof.

28. In a cylinder-mold paper machine, in combination, a cylinder rotatably mounted on front and rear bearings, front and rear bearing housings therefor, front and rear bearing blocks supporting the housings, the front bearing block being removable for opening up a gap facilitating passage of a forming wire, means cooperating with the rear bearing block to cantileverly support the cylinder when the front bearing block is removed, a couch roll rotatably mounted on bearings, support means pivotally connected to the housings and swingably carrying the couch roll bearings, stop means on the housings for limiting the downward swing of said support means and cantileverly supporting said support means, a movable wire carrier formed of a pair of spaced inverted U-shaped members, slide means positioned below said cylinder and said turning roll slidably mounting the inverted U-shaped member for movement thereof axially of and over the cylinder and couch and turning rolls, and spreader poles on said carrier for holding the forming wire on the carrier in an open depending loop large enough to freely encompass the cylinder and the couch roll when the support means are swung downwardly against the stop means.

29. In a cylinder-mold paper machine, in combination, a cylinder rotatably mounted on front and rear bearings, front and rear bearing housings therefor, front and rear bearing blocks supporting the housings, the front bearing block being removable for opening up a gap facilitating passage of a forming wire, a couch roll rotatably mounted on bearings, support means carrying the couch roll bearings and movable therewith toward and away

from the cylinder, stop means limiting movement of said support means toward said cylinder, means cooperating with the rear bearing block to cantileverly support the cylinder when the front bearing block is removed and also the support means carrying couch roll when downward movement of the support means is limited by the stop means, a movable wire carrier, means suspending the carrier over the top of the cylinder and the couch roll for movement laterally of the machine, and spreader poles on said carrier for holding the forming wire on the carrier in an open depending loop large enough to freely encompass the cylinder and the couch roll when the support means engage the stop means.

30. In a cylinder-mold paper machine, in combination, a cylinder rotatably mounted on bearings, support means for the cylinder bearings, an arm extending outwardly from said support means and pivotally connected to said

support means, a first mover detachably connected to the outer extremity of said arm to selectively raise and lower the arm, a couch roll rotatably carried by the arm, a turning roll, a member pivotally connected to said arm and depending therefrom rotatably carrying the turning roll below the couch roll, and a second mover at the pivot connection of said member for swinging said member and the turning roll carried thereby about the pivot connection.

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